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Postural Ergonomic Risk Assessment (Pera) in The Workers of the Automobile Parts Assembly Line: A New Observational Method for the Cube Model

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ABSTRACT

Background and Aim: Assembly lines are associated with health risk and musculoskeletal disorders, particularly in the upper limbs. The aim of this study was to analyze three risk factors of posture, duration and force by using the postural ergonomic risk assessment (PERA) method in the workers of the assembly unit of automobile parts.

Material and Methods: This descriptive cross-sectional study was conducted in the assembly unit of one of the auto parts manufacturing industries. Using the occupational task analysis method, task identified in one hierarchical task analysis (HTA) was divided into a set of sub-tasks. Risk factors of posture, duration and force were assessed by PERA method for each task.

Results: Based on hierarchical task analysis, the vehicle assembly task included four sub-tasks of deburring, washing, vacuum testing and packaging which consisted of a total of 15 operations. Based on the risk factor analysis, we found the greatest risk of force in loading operations and the most awkward posture in sub-task of deburring and packaging. The risk level was estimated high and unacceptable in all three sub-tasks of washing, vacuum testing, and packaging.

Conclusion: Factors of force, posture and duration of work contributed to unacceptable risk in the loading operations of the cylinder head on the pallet and placing it inside the carton. Using tables with adjustable height (reducing the vertical distance between origin and destination) and rotating plates at all angles, together with reducing the exposure time to risk factors by rotation programs for workforces can prevent forward and lateral trunk and neck bending and reduce unacceptable risk levels.

Keywords: Ergonomics, Risk assessment, PERA, Assembly line, Automotive

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